

WE CLAIM

1. A method of synchronising the phase of a local image synchronisation signal generator of a local video data processor in communication with an asynchronous switched packet network to the phase of a reference image synchronisation signal generator of a reference video data processor also coupled to said network, said local and reference processors having respective clocks, said reference and local image synchronisation signal generators generating periodic image synchronisation signals in synchronism with said reference and local clocks respectively, said method comprising the steps of:
  - (i) frequency synchronising said local and reference clocks;
  - 10 (ii) said reference video data processor sending, via said network, to said local data processor an image timing packet providing reference image synchronisation data indicating a difference in timing, measured with respect to said reference processor's clock, between a time at which said image timing packet is launched onto said network and a time of production of a reference image synchronisation signal; and
  - 15 (iii) said local video data processor controlling the timing of production of said local image synchronisation signals in dependence on said reference image synchronisation data and a time of arrival of said timing packet.
  
2. A method according to claim 1, in which said controlling step comprises adjusting said time of production of said local image synchronisation signal by a correction amount derived from a difference between:
  - (i) said reference image synchronisation data; and
  - (ii) a time, measured with respect to said local processor's clock and said local image synchronisation signal, of arrival of said timing packet.
  
- 25 3. A method according to claim 2, comprising the steps of:
  - (i) said reference processor sending to said local processor a plurality of said timing packets; and
  - (ii) said local processor controlling said timing of said production of said local image synchronisation signal in dependence on a function of said differences between:
    - 30 (iii) reference image synchronisation data in said timing packets; and
    - respective times of arrival of said timing packets at said local processor.

4. A method according to claim 3, in which said function is an average of said differences.
5. A method according to claim 1, comprising the step of adding a delay to said local  
5 image synchronisation signal.
6. A method according to claim 5, in which said delay is a predetermined delay.
7. A method according to claim 1, in which said reference data processor comprises a  
10 source of video data produced synchronously with said reference processor's clock, said method comprising:
  - (i) said reference processor sending to said local data processor, via said network, data packets containing said video data, said image timing packets being sent independently of said data packets.
- 15 8. A method according to claim 1, in which said reference data processor comprises a source of video data produced synchronously with said reference processor's clock, said method comprising:
  - (i) said reference processor sending to said local data processor, via said network,  
20 image timing packets containing said video data and also providing said reference image synchronisation data.
9. A method according to claim 1, comprising the step of:
  - (i) said reference processor sensing when said network has capacity to carry an image  
25 timing packet ; and
  - (ii) said reference processor sending an image timing packet when such network capacity exists.
10. A method according to claim 1, in which said step of frequency synchronising said  
30 local and reference clocks comprises the steps of:
  - (i) said reference processor sending to said local data processor, via said network, clock timing packets each providing a destination address of said local processor and reference clock data indicating a time at which said clock timing packet is sent; and

(ii) said local processor controlling said frequency of said local processor's clock in dependence on said reference clock data and times of arrival of said clock timing packets.

11. A method according to claim 10, comprising the steps of:
  - 5 (i) said reference processor counting cycles of said reference processor's clock; and
  - (ii) said reference processor setting said reference clock data as said count of cycles of said reference processor's clock in dependence on a time at which said clock timing packet containing said reference clock data is launched onto said network.
- 10 12. A method according to claim 11, comprising the steps of:
  - (i) said local processor counting cycles of said local processor's clock;
  - (ii) said local processor generating local clock data as a count of cycles of said local processor's clock at a time of receipt of a clock timing packet containing reference clock data; and
  - 15 (iii) said local processor controlling said local processor's clock in dependence on an error signal dependent on a difference between said reference clock data in successively received timing packets and a difference between local clock data indicating said local clock time at said times of receipt of said timing packets.
- 20 13. A method according to claim 12, comprising the step of low pass filtering said error signal to generate a low-pass filtered error signal.
14. A method according to claim 13, comprising the steps of:
  - (i) said local processor accumulating said low-pass filtered error signal; and
  - 25 (ii) said local processor controlling said local processor's clock in dependence on said accumulated error signal.
15. A method according to claim 10, in which said clock timing packet containing said reference image synchronisation data is independent of said clock timing packet.
- 30 16. A method according to claim 10, in which said timing packet containing said reference image synchronisation data also contains said reference clock data.
17. A method according to claim 1, comprising the step of:

said local processor aligning an image of a video signal with said local image synchronisation signal.

18. A method according to claim 1, in which said image synchronisation signal is a field  
5 or frame synchronisation signal.
19. A method according to claim 1, in which said reference image synchronisation data indicates a difference in timing, measured with respect to said reference processor's clock, between a time at which said image timing packet is launched onto said network and a time  
10 of production of an immediately preceding reference image synchronisation signal.
20. A method according to claim 1, in which timing packets carrying information relating to at least two image synchronisation signals are launched onto said network.
- 15 21. Computer software comprising program code for carrying out a method according to claim 1.
22. A providing medium by which software according to claim 21 is provided.
- 20 23. A medium according to claim 22, said medium being a storage medium.
24. A medium according to claim 22, said medium being a transmission medium.
25. A video network comprising:  
25 (i) a reference video data processor having a reference image synchronisation signal generator and a reference clock generator, said reference synchronisation signal generator generating periodic image synchronisation signals in synchronism with said reference clock;  
(ii) a local video data processor having a local image synchronisation signal generator and a local clock generator frequency-locked to said reference clock generator,  
30 said local synchronisation signal generator generating periodic image synchronisation signals in synchronism with said local clock;  
(iii) an asynchronous packet-based network linking said local processor and said reference processor;

(iv) said reference video data processor comprising means for sending, via said network, to said local data processor an image timing packet providing reference image synchronisation data indicating a difference in timing, measured with respect to said reference processor's clock, between a time at which said image timing packet is launched  
5 onto said network and a time of production of a reference image synchronisation signal; and

(v) said local processor comprising means for controlling timing of production of said local image synchronisation signal in dependence on said reference image synchronisation data and said time of arrival of said timing packet.

10 26. A local video data processor having a local image synchronisation signal generator and a local clock generator frequency-lockable to a reference clock generator at a reference video data processor connectable to said local processor via an asynchronous packet-based network, said local synchronisation signal generator generating periodic image synchronisation signals in synchronism with said local clock;

15 (i) said local processor comprising means for controlling timing of production of said local image synchronisation signal in dependence on reference image synchronisation data provided by a timing packet from said reference clock generator and a time of arrival of such a timing packet.

20 27. A reference video data processor having a reference image synchronisation signal generator and a reference clock generator, said reference synchronisation signal generator generating periodic image synchronisation signals in synchronism with said reference clock; said reference processor being connectable via an asynchronous packet-based network to a  
25 local video data processor having a local image synchronisation signal generator and a local clock generator frequency-lockable to said reference clock generator, said local synchronisation signal generator generating periodic image synchronisation signals in synchronism with said local clock;

30 (i) said reference video data processor comprising means for sending, via said network, to said local data processor an image timing packet providing reference image synchronisation data indicating a difference in timing, measured with respect to said reference processor's clock, between a time at which said image timing packet is launched onto said network and a time of production of a reference image synchronisation signal.

28. An asynchronous switched network comprising a plurality of nodes, at least one of which nodes is coupled a data processor according to claim 21 and at least one other of which is coupled to a data processor according to claim 22.
- 5 29. A reference timing packet for use in an asynchronous switched packet network in which packets of video data are transmitted from a source to a destination, said packet providing a destination address of a processor and reference image synchronisation data indicating a difference in timing, measured with respect to a reference clock, between a time at which said packet is launched onto said network and a time of production a reference
- 10 image synchronisation signal.